Corona™ Charged Aerosol Detector

Application note

Non-Ionic Surfactants: Polysorbate 20, Polysorbate 80 and Triton® X100

The need for universal HPLC detection in analytical laboratories is widespread. While several detection technologies (e.g., low wavelength UV, refractive index, evaporative light scattering, chemiluminescent nitrogen detectors) are currently being used, there is significant room for improvement in performance characteristics such as sensitivity, dynamic range, consistency of response factors and gradient or solvent compatibility.

To help address the many challenges of universal detection, ESA has developed the Corona CAD™ detector. This novel technology offers many benefits to analytical scientists including:

- High Sensitivity - Low ng limits of detection.
- More Consistent Response Factors - Response magnitude does not significantly depend on analyte properties (e.g. molar absorbtivity, proton affinity).
- Broad and Useful Dynamic Range - 4 orders of magnitude (ng - µg quantities).
- Excellent Reproducibility - Typically less than 2% RSD.
- Broad Applicability - Can be used with a wide variety of HPLC conditions to measure virtually any nonvolatile analyte including proteins, lipids, carbohydrates and small molecules.
- Ease of Use - Easy setup. Uses minimal bench space and requires only gas input pressure and signal output range to be set.

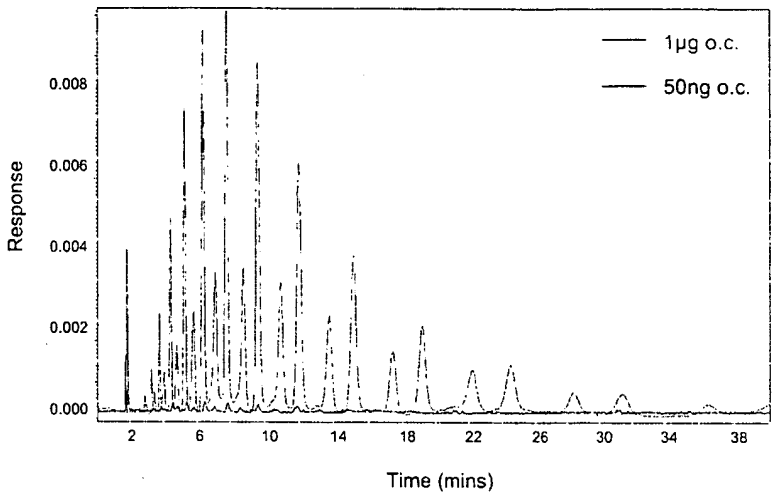

Figure 1. Polysorbate 80.

This application note describes the use of the Corona CAD for the measurement of different polyethylene glycol (PEG) derivatives including polysorbate 80 (Tween® 80) (Figure 1), polysorbate 20 (Figure 2A) and Triton® X100 (Figure 2B). The method has excellent sensitivity (typically <25ng on column, s/n 3:1 polysorbate 80; ~125ng on column, s/n 3:1 Triton X100) and a dynamic range that covers ng to µg levels. This is an example of detection of analytes that possess only a weak chromophore.

Corona parameters

Gas: 35psi via nitrogen generator
Filter: none
Range: 500pA

HPLC Parameters:
Mobile Phase: 65:35; water:methanol
Flow Rate: 0.5mL/min
Column: MD150, 3.2 x 150mm; 3µm
Column Temperature: ambient
Injection Volume: 10µL

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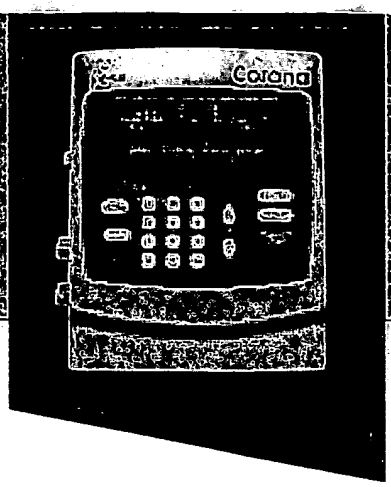
The Corona™ Charged Aerosol Detector



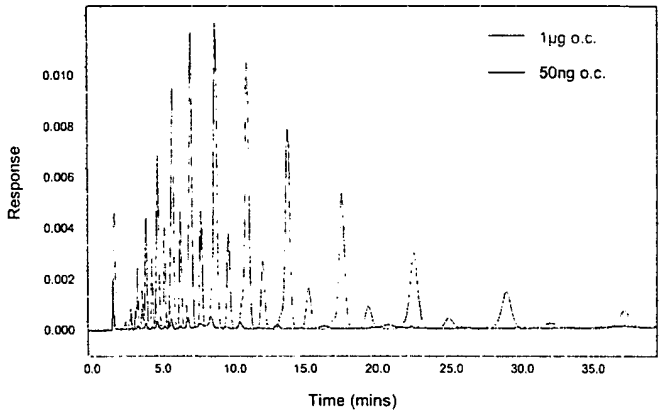


Figure 2A. Polysorbate 20.

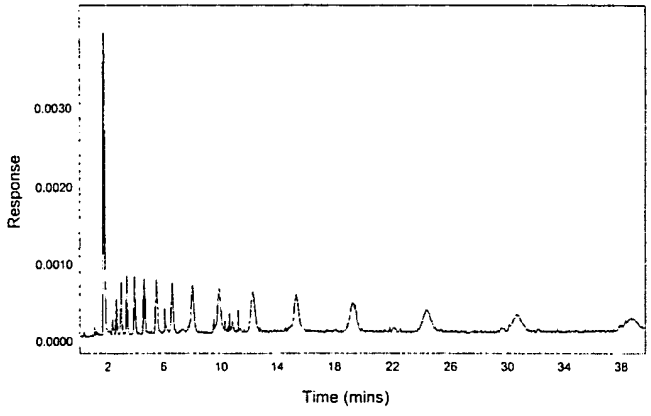


Figure 2B. Triton X100 - 1µg on column.

Sample preparation

Stock solution were diluted in mobile phase.

Conclusions

The Corona CAD provides universal detection of nonvolatile analytes with response independent of chemical properties, a wide dynamic response range, high sensitivity and good precision. These characteristics, along with reliability and simple operation, make this a superior detector for a wide range of HPLC analyses.

For more information about this application, the Corona CAD, or charged aerosol detection visit www.coronacad.com. We are interested in your opinions and are available to answer any questions you may have: please contact a technical representative at 978.250.7082, or if e-mail is more convenient, send your questions to coronacad@esainc.com.

Ordering information

Description	Part Number
Corona	70-6350 (100/120V)
	70-6351 (230/240V)
Thermal Organizer Module	70-5499TA
Nitrogen generator	70-6003
Pump, model 582	70-4050
Autosampler, model 542	70-4152
Quaternary low pressure gradient and degasser	70-5260
Elite software including PC	70-5073
Column, MD150	70-0636

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